

A moving support 3 is positioned between the charged spinnerets 6 and the ground plate 9 to collect the fibers which are formed from the spinnerets and to form an interconnected web of the fibers. The support 3 moves in the direction from the unwind roll 10 to the rewind roll 11.

5 The micro-flow control/pumping system is electrically isolated from the ground and is powered by an isolation transformer 12.

The post-spinning processors 13 have the functions of drying, annealing, membrane transfer (for example, from a stainless steel mesh substrate to another substrate, e.g., a Malox mesh) and post conditioning.

10 Multiple jets with designed array patterns can be used to ensure the fabrication of uniform thickness of the membrane. Hood, heating and sample treatment chambers can also be included to control the solvent evaporation rate and to enhance the mechanical properties. The recovered thickness can be precisely controlled from tens of microns to hundreds of microns. While additional embodiments or modifications
15 to the electrospinning process and apparatus are described below, a more detailed description of an apparatus and method for electrospinning polymeric fibers is set forth in co-pending, commonly owned patent application, Serial No. 09/859,004
20 ^{05/16/2001, now U.S. Patent No. 6,713,001}
~~on even date herewith and incorporated herein for all purposes by reference.~~

Variation of electric/mechanical properties of conducting fluid

The properties of the resulting membrane produced by electrospinning will be affected by the electric and mechanical properties of the conducting fluid. The conductivity of the macromolecular solution can be drastically changed by adding
25 ionic inorganic/organic compounds. The magneto-hydrodynamic properties of the fluid depend on a combination of physical and mechanical properties, (e.g., surface tension, viscosity and viscoelastic behavior of the fluid) and electrical properties (e.g., charge density and polarizability of the fluid). For example, by adding a surfactant to the polymer solution, the fluid surface tension can be reduced, so that the electrostatic